

REMARKS

Claims 1-9 and 16-19 are pending. The Examiner's reconsideration of the objections and rejections is respectfully requested in view of the remarks.

Applicants appreciate the Examiner's indication that the rejection of claims 16-18 under 35 U.S.C. 112 has been overcome.

Claims 1-3 and 6-8 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney (US 2003/0042291) in view of Yen et al. (USPN 4,157,923). The Examiner stated essentially that the combined teachings of Mahoney and Yen teach or suggest all the limitations of claims 1-3 and 6-8.

Claim 1 claims, *inter alia*, "mixing the thermal spray coating and the substrate by friction stir welding, forming a monolithic composite material consisting of the thermal spray coating and the substrate."

Mahoney teaches a method of welding two workpieces having an interface layer deposited there between (see paragraph [0033]). Mahoney does not teach or suggest "mixing the thermal spray coating and the substrate by friction stir welding, forming a monolithic composite material consisting of the thermal spray coating and the substrate" as claimed in claim 1. Mahoney's method forms a weld comprising the first and second workpieces and the interface layer. A weld is formed only at an

interface. Clearly, two workpieces having weld formed there-between is not a monolithic composite material. Mahoney does not teach or suggest a monolithic composite material consisting of a thermal spray coating and a substrate, essentially as claimed in claim 1. Therefore, Mahoney fails to teach or suggest all the limitations of claim 1.

Yen teaches treating a deposited layer and a surface of a subjacent portion of a base metal (see Figures 1-7). Yen does not teach or suggest "mixing the thermal spray coating and the substrate by friction stir welding, forming a monolithic composite material consisting of the thermal spray coating and the substrate" as claimed in claim 1. Yen teaches only surfacing of the base material. The surface treatment of Yen does not form a monolithic structure. Yen does not teach or suggest the formation of a monolithic composite material as claimed in claim 1. Therefore, Yen fails to cure the deficiencies of Mahoney.

The combined teachings of Mahoney and Yen fail to teach or suggest mixing the thermal spray coating and the substrate by friction stir welding, forming a monolithic composite material consisting of the thermal spray coating and the substrate" as claimed in claim 1.

Claims 2, 3 and 6-8 depend from claim 1. The dependent claims are believed to be allowable for at least the reasons

given for claim 1. The Examiner's reconsideration of the rejection is respectfully requested.

Claims 4 and 5 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney in view of Yen as applied to claims 1-3 and 6-8, and further in view of Lazarz et al. (USPN 6,227,435). The Examiner stated essentially that the combined teachings of Mahoney, Yen and Lazarz teach or suggest all the limitations of claims 4 and 5.

Claims 4 and 5 depend from claim 1. The dependent claims are believed to be allowable for at least the reasons given for claim 1. The Examiner's reconsideration of the rejection is respectfully requested.

Claim 9 has been rejected to under 35 U.S.C. 103(a) as being unpatentable over Mahoney in view of Yen as applied to claims 1-3 and 6-8 above, and further in view of Sherman (US 2003/0012678). The Examiner stated essentially that the combined teachings of Mahoney, Yen and Sherman teach or suggest all the limitations of claim 9.

Claim 9 depends from claim 1. The dependent claim is believed to be allowable for at least the reasons given for claim 1. The Examiner's reconsideration of the rejection is respectfully requested.

Claims 16-18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Mahoney in view of Yen as applied to claims 1-3 and 6-8 above, and further in view of Salito (USPN 6,113,991). The Examiner stated essentially that the combined teachings of Mahoney, Yen and Salito teach or suggest all the limitations of claim 16-18.

Claim 16 claims, "A method for densification of a thermal spray coating comprising: depositing a first thermal spray coating on a substrate; forming a composite material by mixing the thermal spray coating and a portion of the substrate by friction stir welding; and depositing a second thermal spray coating on the composite material, wherein the second thermal spray coating is not densified."

Multiple cited prior art references must suggest the desirability of being combined, and the references must be viewed without the benefit of hindsight afforded by the disclosure. The Examiner has chosen a multitude of references, apparently in hindsight, to reject claims 16-18, however, each at least Salito teaches away from the combination. For example, Salito teaches that in the preferred embodiment two layers are applied one *immediately* after the other (see col. 3, lines 3-13) (emphasis added). By the Advisory Action, the Examiner indicated that while immediate application of a second layer is

a preferred embodiment of Salito, that preferred embodiments do not constitute a teaching away from a broader disclosure.

Respectfully, Applicants further point to the disclosure of Salito in which such an immediate deposition is used such that "the intrinsic stress of the materials can be substantially reduced because the substrate does not cool down between the application of the undercoat layer and the application of the covering layer. Moreover, such a proceeding provides for a further saving in cost and time." In view of such disclosure, it is Applicants position that Salito does teach away from a subsequent, non-immediate, deposition because of the likelihood of intrinsic stress in the material being coated.

Accordingly, one would not be lead to combine Salito with Mahoney and Yen because the time needed for creating the friction stir weld of Mahoney would prevent the immediate application of a second layer. Given that Salito teaches away from the proposed combination, the references lack a suggestion or motivation to be combined, these references are not believed to be combinable.


Claims 17 and 18 depend from claim 16. The dependent claims are believed to be allowable for at least the reasons given for claim 16. Reconsideration of the rejection is respectfully requested.

New claim 19 depends from claim 16. Claim 19 is believed to be allowable for at least the reasons given for claim 16.

For the forgoing reasons, the application, including claims 1-9 and 16-19, is believed to be in condition for allowance. Early and favorable reconsideration of the case is respectfully requested.

Respectfully submitted,

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